IN THE CLAIMS:

Please cancel Claim 90 without prejudice to or disclaimer of the subject matter recited therein.

Please amend Claims 1, 2, 13, 14, 60 to 62, 65, 75, 86, 89 and 91 to 95 and add new Claims 94 to 97 to read as follows. A marked-up copy of Claims 1, 2, 13, 14, 60 to 62, 65, 75, 86, 89 and 91 to 95 showing the changes made thereto, is attached. Note that all the claims currently pending in this application, including those not presently amended, have been reproduced below for the Examiner's convenience.

1. (Three Times Amended) A vibration member comprising:

an elastic member including a driving portion having a plurality of protrusions; and

an electro-mechanical energy conversion element in contact with said elastic member, said electro-mechanical energy conversion element having a plurality of electrodes, a corresponding plurality of polarized regions formed by a polarization process of said electro-mechanical energy conversion element, and a modulus of elasticity profile generated by the polarization process, where application of an alternating signal to said electro-mechanical energy conversion element generates a plurality of vibrations in said elastic member, and where a combination of the plurality of vibrations generates a driving vibration in said driving portion,

wherein a rigidity of portions of said elastic member which are located between adjacent protrusions and which also are located between adjacent electrodes is

larger than a rigidity of other portions of said elastic member which are located between adjacent protrusions but which are not also located between adjacent electrodes.

2. (Three Times Amended) A vibration member comprising:

an elastic member including a driving portion; and

an electro-mechanical energy conversion element in contact with said elastic member, said electro-mechanical energy conversion element having a plurality of electrodes, a corresponding plurality of polarized regions formed by a polarization process of said electro-mechanical energy conversion element, and a modulus of elasticity profile generated by the polarization process, where application of an alternating signal to said electro-mechanical energy conversion element generates a plurality of vibrations in said elastic member, and where a combination of the plurality of vibrations generates a driving vibration in said driving portion,

wherein a cross-sectional area of portions of said elastic member which are located between adjacent protrusions and which also are located between adjacent electrodes is larger than a cross-sectional area of other portions of said elastic member which are located between adjacent protrusions but which are not also located between adjacent electrodes.

3. (Twice Amended) A vibration member comprising:

an elastic member including a driving portion; and

an electro-mechanical energy conversion element in contact with said elastic member, said electro-mechanical energy conversion element having a plurality of

electrodes, a corresponding plurality of polarized regions formed by a polarization process of said electro-mechanical energy conversion element, and a modulus of elasticity profile generated by the polarization process, where application of an alternating signal to said electro-mechanical energy conversion element generates a plurality of vibrations in said elastic member, and where a combination of the plurality of vibrations generates a driving vibration in said driving portion,

wherein a density of portions of said elastic member located between said plurality of electrodes is set higher than a density of other portions of said elastic member so as to offset differences in the modulus of elasticity profile generated by the polarization process of said electro-mechanical energy conversion element.

13. (Three Times Amended) A vibration member having an annular or disc shape, comprising:

an elastic member including a driving portion having a plurality of protrusions, and having an annular or disc shape; and

an electro-mechanical energy conversion element having an annular shape and bonded to one surface of said elastic member, said electro-mechanical energy conversion element having a plurality of electrodes, a corresponding plurality of polarized regions formed by a polarization process of said electro-mechanical energy conversion element, and a modulus of elasticity profile generated by the polarization process, where application of an alternating signal to the electro-mechanical energy conversion element generates a plurality of vibrations in said elastic member, and where a combination of the plurality of vibrations generates a driving vibration in said driving portion,

wherein a rigidity of portions of said elastic member which are located between adjacent protrusions and which also are located between adjacent electrodes is larger than a rigidity of other portions of said elastic member which are located between adjacent protrusions but which are not also located between adjacent electrodes.

14. (Three Times Amended) A vibration member having an annular or disc shape, comprising:

an elastic member including a driving portion having a plurality of protrusions, and having an annular or disc shape; and

an electro-mechanical energy conversion element having an annular shape and bonded to one surface of said elastic member, said electro-mechanical energy conversion element having a plurality of electrodes, a corresponding plurality of polarized regions formed by a polarization process of said electro-mechanical energy conversion element, and a modulus of elasticity profile generated by the polarization process, where application of an alternating signal to said electro-mechanical energy conversion element generates a plurality of vibrations in said elastic member, and where a combination of the plurality of vibrations generates a driving vibration in said driving portion,

wherein a cross-sectional area of portions of said elastic member which are located between adjacent protrusions and which also are located between adjacent electrodes is larger than a cross-sectional area of other portions of said elastic member which are located between adjacent protrusions but which are not also located between adjacent electrodes.

15. (Twice Amended) A vibration member having an annular or disc shape, comprising:

an elastic member including a driving portion, and having an annular or disc shape; and

an electro-mechanical energy conversion element having an annular shape and bonded to one surface of said elastic member, said electro-mechanical energy conversion element having a plurality of electrodes, a corresponding plurality of polarized regions formed by a polarization process of said electro-mechanical energy conversion element, and a modulus of elasticity profile generated by the polarization process, where application of an alternating signal to the electro-mechanical energy conversion element generates a plurality of vibrations in said elastic member, and where a combination of the plurality of vibrations generates a driving vibration in said driving portion,

wherein a density of portions of said elastic member located between said plurality of electrodes is set higher than a density of other portions of said elastic member so as to offset differences in the modulus of elasticity profile generated by the polarization process of said electro-mechanical energy conversion element.

17. (Twice Amended) A vibration member comprising:

an elastic member including plural elastic member portions and a driving portion; and

an electro-mechanical energy conversion element held and fixed between said plural elastic member portions, said electro-mechanical energy conversion element having a plurality of electrodes, a corresponding plurality of polarized regions formed by a

polarization process of said electro-mechanical energy conversion element, and a modulus of elasticity profile generated by the polarization process, where application of an alternating signal to said electro-mechanical energy conversion element generates a plurality of vibrations in said elastic member, and where a combination of the plurality of vibrations generates a driving vibration in said driving portion of said elastic member,

wherein the rigidity of portions of said elastic member located between adjacent electrodes of said plurality of electrodes having different directions of polarization from each other is set larger than the rigidity of other portions of said elastic member so as to offset differences in the modulus of elasticity profile generated by the polarization process of said electro-mechanical energy conversion element.

18. (Twice Amended) A vibration member comprising:

an elastic member including plural elastic member portions and a driving portion; and

an electro-mechanical energy conversion element held and fixed between said plural elastic member portions, said electro-mechanical energy conversion element having a plurality of electrodes, a corresponding plurality of polarized regions formed by a polarization process of said electro-mechanical energy conversion element, and a modulus of elasticity profile generated by the polarization process, where application of an alternating signal to said electro-mechanical energy conversion element generates a plurality of vibrations in said elastic member, and where a combination of the plurality of vibrations generates a driving-vibration in said driving portion,

wherein portions of said elastic member located between said plurality of

electrodes are cut out so as to offset differences in the modulus of elasticity generated by the polarization process of said electro-mechanical energy conversion element.

57. (Amended) A vibration wave driving apparatus including said vibration member according to Claim 1 and a contact member in press contact with said vibration member and movable relative to said vibration member by the driving force of said driving portion.

58. (Amended) A vibration wave driving apparatus including said vibration member according to Claim 2 and a contact member in press contact with said vibration member and moveable relative to said vibration member by a driving force of said driving portion.

59. (Amended) A vibration wave driving apparatus including said vibration member according to Claim 3 and a contact member in press contact with said vibration member and moveable relative to said vibration member by a driving force of said driving portion.

60. (Twice Amended) A vibration wave driving apparatus including said vibration member according to Claim 13 and a contact member in press contact with said vibration member and moveable relative to said vibration member by a driving force of said driving portion.

61. (Twice Amended) A vibration wave driving apparatus including said vibration member according to Claim 14 and a contact member in press contact with said vibration member and moveable relative to said vibration member by a driving force of said driving portion.

62. (Twice Amended) A vibration wave driving apparatus including said vibration member according to Claim 15 and a contact member in press contact with said vibration member and moveable relative to said vibration member by a driving force of said driving portion.

63. (Amended) A vibration wave driving apparatus including said vibration member according to Claim 1 and a contact member in press contact with said vibration member through a fluid, said contact member being moveable relative to said vibration member by a driving force of said driving portion.

64. (Amended) A vibration wave driving apparatus including said vibration member according to Claim 13 and a contact member in press contact with said vibration member through a fluid, said contact member being moveable relative to said vibration member by a driving force of said driving portion.

65. (Twice Amended) A vibration wave driving apparatus including said vibration member according to Claim 2 and a contact member in press contact with said

vibration member through a fluid, said contact member being moveable relative to said vibration member by a driving force of said driving portion.

67. A vibration member according to Claim 1, wherein adjacent electrodes have different directions of polarization.

68. A vibration member according to Claim 2, wherein adjacent electrodes have different directions of polarization.

69. A vibration member according to Claim 3, wherein adjacent electrodes have different directions of polarization.

70. A vibration member according to Claim 1, wherein the plurality of electrodes are formed by polishing and dividing said electro-mechanical energy conversion element.

71. A vibration member according to Claim 2, wherein the plurality of electrodes are formed by polishing and dividing said electro-mechanical energy conversion element.

72. A vibration member according to Claim 3, wherein the plurality of electrodes are formed by polishing and dividing said electro-mechanical energy conversion element.

73. A vibration member according to Claim 1, wherein said electro-mechanical energy conversion element is formed by a plurality of elements.

74. A vibration member according to Claim 3, wherein said electro-mechanical energy conversion element is formed by a plurality of elements.

75. (Amended) A vibration member according to Claim 2, wherein among grooves which are formed between adjacent protrusions, those grooves which also are located at positions between adjacent electrodes are more shallow than the other grooves.

76. (Amended) A vibration member according to Claim 3, wherein said elastic member is made of a material having pores, and a number of the pores in a portion of said elastic member located between said plurality of electrodes is set less than that in other portions of said elastic member.

77. A vibration member according to Claim 3, wherein said elastic member is made of a material having pores, and the pores in a portion of said elastic member located between said plurality of electrodes are impregnated with a material having melting point which is lower than that of the other material of said elastic member.

78. A vibration member according to Claim 13, wherein adjacent electrodes have different directions of polarization.

79. A vibration member according to Claim 14, wherein adjacent electrodes have different directions of polarization.

80. A vibration member according to Claim 15, wherein adjacent electrodes have different directions of polarization.

81. A vibration member according to Claim 13, wherein the plurality of electrodes are formed by polishing and dividing said electro-mechanical energy conversion element.

82. A vibration member according to Claim 14, wherein the plurality of electrodes are formed by polishing and dividing said electro-mechanical energy conversion element.

83. A vibration member according to Claim 15, wherein the plurality of electrodes are formed by polishing and dividing said electro-mechanical energy conversion element.

84. A vibration member according to Claim 13, wherein said electro-mechanical energy conversion element is formed by a plurality of elements.

85. A vibration member according to Claim 15, wherein said electro-mechanical energy conversion element is formed by a plurality of elements.

86. (Amended) A vibration member according to Claim 14, wherein among grooves which are formed between adjacent protrusions, those grooves which also are located at positions between adjacent electrodes are more shallow than the other grooves.

87. A vibration member according to Claim 15, wherein said elastic member is made of a material having pores, and a number of pores in a portion of said elastic member located between adjacent electrodes of said plurality of electrodes is set less than that in other portions of said elastic member.

88. A vibration member according to Claim 15, wherein said elastic member is made of a material having pores, and the pores in a portion of said elastic member located between adjacent electrodes of said plurality of electrodes are impregnated with a material having a melting point which is lower than that of other material of said elastic member.

89. A vibration member according to Claim 13, wherein said electro-mechanical energy conversion element has a plurality of electrodes provided in a peripheral direction, and a width in a radial direction of a portion between adjacent electrodes of the plurality of electrodes is set larger than that of an electrode.

90. Cancelled.

91. (Amended) A vibration member comprising:

an elastic member including a driving portion having a plurality of protrusions; and

an electro-mechanical energy conversion element in contact with said elastic member, said electro-mechanical energy conversion element having a plurality of electrodes, a corresponding plurality of polarized regions formed by a polarization process of said electro-mechanical energy conversion element, and a modulus of elasticity profile generated by the polarization process, where application of an alternating signal to said electro-mechanical energy conversion element generates a plurality of vibrations in said elastic member, and a combination of the plurality of vibrations generates a driving vibration in said driving portion,

wherein a rigidity of portions of said elastic member which are located at positions of said protrusions and which also are located between adjacent electrodes is larger than a rigidity of other portions of said elastic member which are located at positions of said protrusions but which are not also located between adjacent electrodes.

92. (Amended) A vibration member comprising:

an elastic member including a driving portion having a plurality of protrusions; and

an electro-mechanical energy conversion element in contact with said elastic member, said electro-mechanical energy conversion element having a plurality of electrodes, a corresponding plurality of polarized regions formed by a polarization process of said electro-mechanical energy conversion element, and a modulus of elasticity profile

generated by the polarization process profile, where application of an alternating signal to said electro-mechanical energy conversion element generates a plurality of vibrations in said elastic member, and a combination of the plurality of vibrations generates a driving vibration in said driving portion,

wherein a cross-sectional area of portions of said elastic member which are located at positions of said protrusions and which also are located between adjacent electrodes is larger than that of other portions of said elastic member which are located at positions of said protrusions but which are not also located between adjacent electrodes.

93. (Amended) A vibration member according to Claim 92, wherein among grooves which are formed between adjacent protrusions, those grooves which also are located at positions between adjacent electrodes are more shallow than the other grooves.

--94. (New) A vibration member comprising:

an elastic member including a driving portion having a plurality of protrusions; and

an electro-mechanical energy conversion element in contact with said elastic member, said electro-mechanical energy conversion element having a plurality of electrodes, a corresponding plurality of polarized regions formed by a polarization process of said electro-mechanical energy conversion element, and a modulus of elasticity profile generated by the polarization process, where application of an alternating signal to said electro-mechanical energy conversion element generates a plurality of vibrations in said

elastic member, and where a combination of the plurality of vibrations generates a driving vibration in said driving portion,

wherein a density of portions of said elastic member which are located between adjacent protrusions and which also are located between adjacent electrodes is higher than a density of portions of said elastic member which are located between adjacent protrusions but which are not also located between adjacent electrodes.

95. (New) A vibration member having an annular or disc shape, comprising:

an elastic member including a driving portion having a plurality of protrusions, and having an annular or disc shape; and

an electro-mechanical energy conversion element having an annular shape and bounded to one surface of said elastic member, said electro-mechanical energy conversion element having a plurality of electrodes, a corresponding plurality of polarized regions formed by a polarization process, where application of an alternating signal to the electro-mechanical energy conversion element generates a plurality of vibrations in said elastic member, and where a combination of the plurality of vibrations in said elastic member, and where a combination of the plurality of vibrations generates a driving vibration in said driving portion,

wherein a density of portions of said elastic member which are located between adjacent protrusions and which also are located between adjacent electrodes is higher than a density of portions of said elastic member which are located between adjacent protrusions but which are not also located between adjacent electrodes.

96. (New) A vibration member according to Claim 1, wherein a groove is formed on said elastic member so as to generate a difference in a natural frequency of a plurality of vibration series which forms a vibration mode having a degree different from that of the driving vibration.

97. (New) A vibration member according to Claim 2, wherein a groove is formed on said elastic member so as to generate a difference in a natural frequency of a plurality of vibration series which forms a vibration mode having a degree different from that of the driving vibration.--

REMARKS

The claims now pending in the application are Claims 1 to 3, 13 to 15, 17, 18, 57 to 65, 67 to 89 and 91 to 97. The independent claims being Claims 1 to 3, 13 to 15, 17, 18, 91, 92, 94 and 95. Claim 90 has been cancelled. Claims 1, 2, 13, 14, 60 to 62, 65, 75, 86, 89, and 91 to 95 have been amended herein.

In the Official Action dated September 16, 2002, Claims 1, 2, 13, 14, 57, 58, 60 to 65, 67, 68, 70, 73, 75, 78, 79, 81, 82, 84, 86 and 89 to 93 were rejected under 35 U.S.C. § 102(a), as anticipated by any one of U.S. Patent No. 5,821,670 (Tobe), U.S. Patent No. 5,798,598 (Fujimoto) and U.S. Patent No. 5,025,186 (Tsukada).

Initially, Applicant gratefully acknowledges the Examiner's indication that the application contains allowable subject matter, and that Claims 3, 15, 17, 18, 59, 69, 72, 74, 76, 77, 80, 83, 85, 87 and 88 are allowed.